mical to keep the prepared fibrin by drying it in a current of air than to preserve it under ether, as usually recommended.

September 27 ARTHUR DOWNES

Note on Actinometry by Oxalic Acid

OXALIC acid is entirely oxidised by light (*Proc. Roy. Soc.* No. 191, and *Chemical News*, October 8, 1880), and affords, by reason of its own physical properties and those of the products of the reaction, an excellent medium for actinometry. A preliminary series of experiments on the physical conditions which modify this oxidation show that, *c.p.*, the effect is greater in direct proportion to the extent of exposed surface of the solution but inversely as its depth. It is greater also in proportion to the strength of the solution; and it would appear—I speak for the present quite provisionally—that in this relation the reaction follows a definite law, being *as the square root of the mass.*

September 27 ARTHUR DOWNES

Humming in the Air caused by Insects

IN a letter to the Hon. Daines Barrington (letter lxxx.) the Rev. Gilbert White, the well-known author of the "Natural History of Selborne," mentions a strange humming sound in the air. He writes:—"There is a natural occurrence to be met with upon the highest parts of our downs in hot summer days which always amuses me much without giving me any satisfaction with respect to the cause of it: and that is a loud audible humming as of bees in the air, though not one insect is to be seen. This sound is to be heard distinctly the whole common through from the Money Dells to my avenue gate. Any person would suppose that a large swarm of bees was in motion, and playing about over his head. This noise was heard last week on June 28."

It is singular that no explanation has been offered by any one for such a common phenomenon. I am convinced that the humming sound mentioned by Gilbert White was nothing more than the noise occasioned by the vibrations of millions of insects' wings in the air. In hot summer evenings in particular I have heard these peculiar humming sounds, and know them to be caused by immense hordes of gnats and midges which fill the air with their numbers. W. HARCOURT BATH

The Limes, Sutton Coldfield, near Birmingham, October

Mimicry in Snakes

A CURIOUS fact has been lately brought to my notice by a friend of mine, Mr. H. M. Oakley, in connection with the *Dasypeltis scaber*, Linn., or egg-eating snake—the "Eijer eter" of the Dutch colonists—which, if not already well known, may prove of interest to some of your readers. The specimen obtained by Mr. Oakley was caught at Hout Bay some twenty miles from Cape Town, and is about 3 feet in length, and its size, markings, and colour bear sufficient resemblance to those of the Berg Adder (*Clothos atropos*, Linn.) to be easily mistaken for that snake. It also has keeled scales, generally characteristic, at the Cape, of venomous species. Its head has, however, the long lacertine shape distinctive, here, of harmless snakes, but, when aroused and alarmed or irritated, it flattens it out until it assumes the usual viperine shape of the "club" in a playing card. It then coils as for a spring, erects its head with every appearance of anger, produces a hissing noise with its scales, not unlike the hiss of a puff adder or cobra, and darts forward as if to strike its fangs into its foe, and in every way exactly simulates the motions of an irritated berg adder. This snake has, however, neither fangs nor teeth (which, indeed, would not be required for egg-swallowing), and is not poisonous, a fact which was placed beyond doubt by Mr. Oakley repeatedly placing his finger in the reptile's mouth. This seems a clear instance of mimicry of another species for defensive purposes, but I am not aware of another instance among ophidians.

W. HAMMOND TOOKE

Cape Town, Cape of Good Hope, September 8

THE COLONIAL AND INDIAN EXHIBITION

CONTINUING our review of the most noteworthy or interesting vegetable products now being exhibited at South Kensington, we find in close contiguity to those from British Guiana, described in NATURE, July 15, p. 242, the exhibits from

Mauritius.—The entire collection, though not large, is one of some interest, and the vegetable kingdom plays by far the most important part in the exhibits. The collection of fibres will attract attention as much for its completeness as for the care with which they have been prepared. Many are of scientific interest only, being obtained from plants that could never be turned to commercial account, such, for instance, as *Hyophorbe Verschaffeltii*, *Latania commersonii*, *Lodoicea sechellarum*, *Macrozamia spiralis*, &c. This collection is exhibited by the Botanical Gardens, as is also a collection of woods of similar interest. Some notes on these woods are useful. Thus, we are told that *Tecoma pentaphylla* has a soft white wood, not much used, and that it is a moderate-sized shade-tree of rapid growth. Samples of the wood, however, grown in the West Indies, show a close and even grain, and are fairly hard—so hard, indeed, as to suggest its suitability for wood-engraving, for which purpose it has been tried in this country, and though not by any means equal to boxwood, was reported upon as likely to be found useful for some kinds of work. The soft wood of *Ficus mauritiana* is used in the colony both for firewood and for hollowing out for canoes, while the hard wood of the Ebony (*Diospyros Ebenum*), which is described as being either black or sometimes streaked with yellow and brown, is used for inlaying, furniture, and ornamental turnery. The Bois Maigre (*Nuxia verticillata*) is said to produce a short-grained timber which decomposes rapidly, but when young it makes excellent walking-sticks, which are much sought for. *Terminalia Benzoin*, a large tree, which has become scarce in Mauritius, produces a wood valued for many purposes. It would seem that the wood is sometimes fragrant, for it is said that "some parts of the tree were once much burnt in Mauritius as an incense." Another odoriferous wood is *Noronhia Broomieana*, called here Bois Sandal. The Carambole (*Averrhoa Carambola*), valued in India for the sake of its acid fruits, is planted in Mauritius for the same purpose, the fruits being eaten either raw or made into tarts.

Probably the exhibits that attract most attention in the Mauritius Court are the fine samples of vanilla pods, covered as they are with an abundant coating of crystals, and shedding forth, even through the glass cases which cover them, the delicate fragrance for which vanilla is celebrated.

Seychelles.—Amongst these exhibits the Double Cocoa-Nut, or Cocoa de Mer (*Lodoicea sechellarum*) is the most prominent. The double form of the fruit, which is its normal condition, is well shown, as well as a triple-lobed nut, which is not very uncommon. Here also are fine samples of vanilla, nearly, if not quite, equal to those from Mauritius. Dried papaw juice and some remarkably good specimens of essential oils are shown, all of which are extremely creditable to the colony.

Cyprus.—The vegetable products shown in this Court are not numerous, nor is there anything of novelty excepting perhaps a peculiar black substance described as honey, from the Carob or Locust Bean (*Ceratonia Siliqua*). The pods themselves are also exhibited, and their production, it seems, has greatly increased in recent years, stimulated by an increasing demand, especially in this country, where they are used very largely in making the patent compound cattle-foods, in consequence of their saccharine and nutritious character. Low freights have much encouraged the trade in carobs, enabling shippers to sell them at moderate prices. The quantity of carobs exported from Cyprus in 1884 amounted to 30,000 tons, about one-half of which came to England. The finest quality is produced in Limassol and Lefcara, and obtain relatively higher prices than those of Kyrenia. The average price realised for these pods is about 3*l.* per ton.

Another product of great importance to Cyprus up to the year 1873 was madder from *Rubia tinctorum*, an article of considerable profit to landowners. It was largely used in dyeing Turkey-red yarns. The discovery of coal-tar dyes seriously interfered with the demand for madder, so that its growth has much decreased. In consequence, however, of the mineral dyes being much inferior in fastness, madder is being again sought after, and should the demand continue, there is a prospect that madder will again assume its former importance. Among other interesting exhibits, the rude native cart of the form in use for over 2000 years, and still in use, attracts much attention, as does the threshing-board, the same as was in use in patriarchal times. It is studded with flints on the under-side, and is drawn by bullocks or horses over the grain, by which means the seed is separated from the ears and the straw reduced to small particles. This is said to be the only system employed for threshing in Cyprus.

A few well-known woods, such as Olive (*Olea europea*), Cedar of Lebanon (*Cedrus Libani*), Bay Laurel (*Laurus nobilis*), Chian Turpentine, (*Pistacia Terebinthus*) are exhibited, as well as the concrete resin of the latter, or crude Chian turpentine, under the name of Trimithia gum, in curious small greenish-coloured pots.

Malta.—The Maltese exhibits will be best remembered by the fine show of lace and silver filigree work. A good show is also made of preserved fruits, and tobacco of very fine quality and varied forms is exhibited; besides these there are very few other vegetable products.

JOHN R. JACKSON

GREEK GEOMETRY

WE have before us parts 6, 7 (?), of Dr. Allman's "Greek Geometry from Thales to Euclid,"[1] in which we are brought almost into touch with Euclid. There is then but little wanting to complete the task commenced by the author in 1877, in the performing of which so much light has been thrown upon the contributions of the early Greek mathematicians to geometrical science.

In NATURE (vol. xxx. pp. 315, 316) we gave an account of Archytas and Eudoxus; the present parts commence with a discussion of the claims of Menæchmus, "pupil of Eudoxus, associate of Plato, and the discoverer of the conic sections." In the forefront are placed translations of eleven fragments which contain what is known of Menæchmus. The various points which arise are most carefully reasoned out, with considerable detail, but we cannot attempt here to compress what is already concisely given. The notes are very valuable, and show over what a wide field of reading Dr. Allman's researches have taken him. We note only the prominence given to M. Tannery's papers, as we have frequently had occasion in these pages to draw attention to this mathematician's valuable memoirs on Greek geometry. The last part (which we have numbered 7) opens with an account of Dinostratus, brother of Menæchmus, whose name occurs in connection with the quadratrix. Dr. Allman states the case of Dinostratus *versus* Hippias: "The result of the whole discussion seems to be that the quadratrix was invented, probably by Hippias of Elis, with the object of trisecting an angle, and was originally employed for that purpose; that subsequently Dinostratus used the curve for the quadrature of the circle, and that its name was thence derived." Sporus (or Porus) comes in for a mention, and then we come to Aristæus, who wrote on the conic sections, and is the author of the theorem, "The same circle circumscribes the pentagon of the dodecahedron and the triangle of the icosahedron, these solids being inscribed in the same sphere." This occurs in his "Comparison of the Regular Solids." Bretschneider thinks the thirteenth Book of Euclid's Elements is "a recapitulation, at least partial, of this work of Aristæus" (cf. also Dr. C. Taylor's "Conics," p. xxxiii.).

Of Aristæus, in closing, our author writes: he "may, therefore, be regarded as having continued and summed up the work, which, arising from the speculations of Philolaus, was carried on by his successors—Archytas, Eudoxus, and Menæchmus. These men were related to one another in succession as master and pupil, and it seemed to me important that the continuity of their work should not be broken in its presentation."

We hope another year will suffice to bring this sketch of Greek geometry to a close, and that then the author will collect these parts, whose appearances have been extended over nearly ten long years, in one volume, with such additional notes as his subsequent reading will enable him to append.

We can only commend these two parts, as we have the previous ones, to the careful study of all who are interested in these researches: they have taken a high place in the estimation of foreign mathematicians, even in cases where the author's conclusions have not been unhesitatingly accepted.

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[1] The following references to the several parts may be of service:—Hermathena, part 1, vol. iii. No. 5, pp. 160-75; part 2, same number, pp. 175-207; part 3, vol. iv. No. 7, pp. 180-228; part 4, vol. v. No. 10, pp. 186-212; part 5, same number, pp. 212-235; part 6, vol. v. No. 11, pp. 403-32; part 7 (?), vol. vi. No. 12, pp. 105-30.

THE HYGIENE OF THE VOCAL ORGANS[1]

THE cultivation of the voice and the means of maintaining it in a state of excellence under the varying strain of daily life, are subjects of interest to us all, but become of paramount importance to those who are professionally brought before the public as speakers or singers. Although the laryngoscope is invaluable in the recognition and treatment of disease, it is surprising how little it has up to the present time added to our knowledge of the physiology of the larynx.

The difficulties of examining the larynx during singing are so great that a large number of singers have to be examined to obtain a complete view of the whole process by even the most expert laryngoscopist. The results of the examination of some three or four hundred persons with fine voices, including most of the best singers of the day, form not the least interesting portion of the book.

There is no question that the voice, whether the note be high or low, whether a chest or head note, whether bass or falsetto, is produced by vibration of the free edges of the vocal cords, which are two movable ligamentous bands about half an inch long stretched from back to front of the larynx. In other words, the only place where all notes, whatever their character may be, can be produced, is in the larynx.

These bands are attached anteriorly in contact with one another, but their posterior fourth is attached to the small pyramidal-shaped arytenoid cartilages, which can move laterally. The glottis, the space between them, is thus divided into a ligamentous and a cartilaginous portion. There is the greatest difference of opinion among authorities as to the position of the cords and arytenoid cartilages, and as to how much of the cord vibrates in the production of the various sounds.

Dr. Mackenzie divides the range of the voice into two registers, viz. one (chest) in which the pitch is raised, by means of increasing tension and a (consequent trivial) lengthening of the cords, as the voice sings upwards; the other (head), by which a similar result is brought about by gradual shortening of the vibrating reed, which is still tense, though less so than in the chest register. These fundamental divisions are the so called chest and head modes of production, and the falsetto corresponds to the head register of the female voice, of which it is an imitation.

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[1] "The Hygiene of the Vocal Organs." By Morell Mackenzie, M.D. Pp. 223. (London: Macmillan & Co., 1886.)